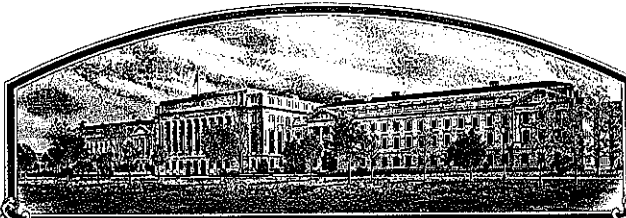


No.

200000168



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Utah State University

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE FOREGOING PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BARLEY

'Brigham'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this fourteenth day of April, in the year of our Lord two thousand.

Attest:

San Marie

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate)		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
Utah State University		UT90B772-2120	Brigham
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)		5. TELEPHONE (include area code)	FOR OFFICIAL USE ONLY PVPO NUMBER 00000168
Logan, UT 84322		435-797-2243	
		6. FAX (include area code)	FILING DATE
		435-797-3376	02-25-2000
7. GENUS AND SPECIES NAME	8. FAMILY NAME (Botanical)		FILING AND EXAMINATION FEE:
Hordeum vulgare	Poaceae (Gramineae)		\$ 2450.00
9. CROP KIND NAME (Common name)			DATE
Barley			2-25-2000
10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) (Common name)			CERTIFICATION FEE:
State University			\$ 300
11. IF INCORPORATED, GIVE STATE OF INCORPORATION		12. DATE OF INCORPORATION	DATE
			MAR 15 00
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS			14. TELEPHONE (include area code)
Dr. Rulon S. Albrechtsen Plants, Soils, & Biometeorology Dept. Utah State University Logan, UT 84322-4820			435-797-2243
			15. FAX (include area code)
			435-797-3376
16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)			
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of the Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Applicant's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasurer of the United States" (Mail to PVPO)			
17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act)			
<input checked="" type="checkbox"/> YES If "yes," answer items 18 and 19 below <input type="checkbox"/> NO If "no," go to item 20			
18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?		19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?	
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		<input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED	
20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?			
<input checked="" type="checkbox"/> YES If "yes," give names of countries and dates <input type="checkbox"/> NO			
U.S., March 2000			
21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.			
The undersigned applicant(s) is(are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.			
Applicant(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF APPLICANT (Owner(s))		SIGNATURE OF APPLICANT (Owner(s))	
NAME (Please print or type)		NAME (Please print or type)	
WAYNE H. WATKINS		H. PAUL RASMUSSEN	
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
DIRECTOR TECHNOLOGY COMMUNICATIONS	12 FEB 00	DIRECTOR	2-24-2000

Exhibit A - Origin and Breeding History**BRIGHAM**

Summer, 1985: Original cross made at Logan, Utah, by Dr. Rulon S. Albrechtsen.

Cross number was UTB772

UTB772 = UT81B275-248/UT Short #1

UT81B275-248 = UT S.D.B1-1009/'Steptoe'

UT S.D.B1-1009 = 'Woodvale'/'Primus'/S.D. 67-297

UT S.D.B1-1009 = a sib to 'Bracken'

Woodvale = a reselection of 'Vale'

Primus = a South Dakota variety

S.D. 67-297 = a South Dakota breeding line

Steptoe = WA Sel. 3564/'Unitan'

UT Short #1 = UTB2-1694-1995

UTB2-1694-1995 = S.D.S.S./'Primus'

S.D.S.S. = a South Dakota breeding line

Primus = a South Dakota variety

Winter, 1985-86: F₁ plants grown in the greenhouse at Logan, Utah.

There was no segregation observed in F₁ plants.

Summers, 1986,
1987 and 1988:

F₂ through F₄ generation plants grown in the field at Logan, Utah in space-planted (plants 6 inches apart with 12-inch row spacing) modified bulk populations which were selected for plants possessing the following characteristics:

- Four or more fertile tillers per plant in space-planted stands
- Early to mid-season heading date
- Early to mid-season maturity date
- Less than 90 cm tall
- Zero to near-zero lodging
- Upright stems

- Desirable plant confirmation
- Plump seeds
- White aleurone
- Complete exertion of spike from flag leaf at maturity
- Tough (not brittle) stem and neck
- Lemma awns longer than spike
- Free of barley loose smut (caused by *Ustilago nuda* (Jens.) Rostr.)
- Free of barley covered smut (caused by *Ustilago hordei* (Pers.) Lagrh.)
- Moderately free of powdery mildew (caused by *Erysiphe graminis* DC. f sp. *hordei* Em. marchal)

Selected seed was bulked for each succeeding generation.

Summer, 1989:

F₅ plants grown at Logan, Utah in a space planted (plants 6 inches apart with 12-inch row spacing) modified bulk population and single heads were selected from 260 plants possessing the same characteristics as those listed for the F₂ through F₄ generations. Seed from individual heads was maintained separately.

Summer, 1990:

Seed from the 260 individual selected heads was grown in F₆ head rows at Logan, Utah, where all rows were evaluated for the same characteristics as those listed for the F₂ through F₅ generations. Only desirable rows were harvested. Seed from harvested rows was subjected to protein evaluation and kernel rating in the laboratory. Row 2120 (identified as UT90B772-2120) was selected as a single head row for additional testing. It was found to breed true for rough lemma awns.

Summer, 1991:

UT90B772-2120 was evaluated for yield and test weight, in addition to the characters listed for the F₆ head rows, in a single-replicate preliminary irrigated yield test (which included Steptoe check plots) grown at Logan, Utah.

Summer, 1992:

UT90B772-2120 was evaluated for the same characters as those listed for the preliminary irrigated yield test, in a 4-replicate advanced yield nursery at Logan, Utah.

Summers, 1993
through 1999:

UT90B772-2120 was evaluated for the same characters listed for the advanced irrigated yield test, in replicated irrigated yield tests at four major irrigated barley production sites in Utah.

Summer, 1997:

UT90B772-2120 was evaluated for the same characters listed for the replicated Utah irrigated yield tests, in the Western Regional Spring Barley Nursery grown at 12 locations throughout the western U.S. (identified as UT002120). It ranked 3rd in yield, averaged over all locations (among 32 entries).

Summers, 1993
through 1999:

UT90B772-2120 was evaluated for the same characters listed for the replicated Utah irrigated yield tests, in replicated dryland yield tests at two major dryland barley production sites in Utah.

Summer, 1995,
1996 and 1997:

UT90B772-2120 was evaluated for the same characters listed for the replicated Utah irrigated yield tests, in the Western Regional Dryland Spring Barley Nursery grown at 9 locations in 1995 and 1996, and at 8 locations in 1997 (a total of 26 location years), where it was identified as UT002120. It ranked 15th in yield in 1995 (among 30 entries), 16th in 1996 (among 30 entries), and 22nd in 1997 (among 30 entries).

Summer, 1995:

Selected 300 heads of UT90B772-2120 to be used for production of Breeder seed.

Summer, 1996:

Breeder seed of UT90B772-2120 was produced at Logan, Utah, from the 300 heads selected in 1995. Selected heads were grown in individual head rows. Questionable rows were rogued out. Remaining rows were harvested in bulk.

Summer, 1997:

Foundation seed of UT90B772-2120 was produced at Cove, Utah, from Breeder seed produced in 1996. The Foundation field was rogued heavily for any questionable plants.

Summer, 1998:

Registered seed of Brigham (UT90B772-2120) was produced by four selected Utah growers.

Summer, 1999:

Certified seed of Brigham was produced by selected growers.

March, 2000:

Certified seed of Brigham will be marketed for commercial production.

Brigham has been observed to be stable for 10 generations (beginning with the F₆ head row from which it originated in 1990, through the F₁₅ Certified seed production fields examined in 1999). There have been no variants observed. Any questionable plants rogued from Breeder, Foundation, Registered or Certified plantings showed very minor, if any, variation and were likely due to environmental variations. They were removed strictly as a precautionary measure.

Exhibit B - Novelty Statement for Brigham

To our knowledge, **Brigham** most nearly resembles Rollo and Bracken barleys. Differences between Brigham and the other two varieties include, but are not restricted to, the following characteristics:

1. Neck shape of Brigham is classified as snaky (Figure 4). Figure 4 does not give an accurate portrayal of the snaky neck shape of Brigham. The photograph shows only one dimensional bending of the stem, while in actuality, bending occurs in two or more directions. No other variety with which Brigham was compared has this characteristic.
2. Head shape of Brigham is slightly tapering (similar to that of Bracken), while that of Rollo is strap (Figures 1 & 2).
3. Head density of Brigham [Erect (Not dense), (2.6 - 2.8 mm/internode)] is less dense than that of Rollo [Erect (Dense), 2.0 - 2.2 mm/internode] or Bracken [Erect (Dense), 1.9 - 2.1 mm/internode], (Figures 2 & 3).
4. Glume length for Brigham is $\frac{1}{2}$ that of the lemma, while that of both Rollo and Bracken is more than $\frac{1}{2}$ of the lemma.
5. Glume hair length for Brigham and Rollo is long, while that for Bracken is short.
6. Glume hair covering for Brigham is essentially complete while that of Rollo is restricted to the middle of the glume, and that of Bracken is confined to a band.
7. Glume awns on Brigham are equal to the length of the glume (similar to Bracken), while those on Rollo are more than equal to the length of the glume.
8. Glume awn surface of Brigham is semirough, compared to semismooth for Rollo, and smooth for Bracken.
9. Brigham has widely flaring lemma awns, while those for Rollo and Bracken are erect or only slightly flaring (Figure 1). The lemma awns on Brigham flare distinctly wider than on any other variety with which it was compared.
10. The lemma awn surface of Brigham is semirough, while that of Rollo is semismooth, and that of Bracken is smooth.
11. The lemma base of Brigham has a slight crease, while Rollo and Bracken both have a transverse crease.

Our records indicate that 'Bracken' has glumes "with few or no hairs". See the Crop Science Registration for 'Bracken' (Crop Sci 33: 1413-1414 (1993)). M4 2-29-2000

OBJECTIVE DESCRIPTION OF VARIETY BARLEY (*HORDEUM VULGARE*)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

Utah Agricultural Experiment Station
ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)
Utah State University
Logan, UT 84322-4810

FOR OFFICIAL USE ONLY

PVPO NUMBER 200000168

VARIETY NAME OR TEMPORARY DESIGNATION	Brigham
---------------------------------------	---------

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in first box (i.e.,

0	8	9
---	---	---

 or

0	9
---	---

) when number is either 99 or less or 9 or less.

1. GROWTH HABIT:

1 - SPRING 2 - FACULTATIVE WINTER 3 - WINTER 3 Early Growth: 1 - PROSTRATE 2 - SEMIPROSTRATE 3 - ERECT

2. MATURITY (50% Flowering):

2 1 - EARLY (California Mariout) 2 - MIDSEASON (Betzes) 3 - LATE (Frontier)

<input type="checkbox"/>	No. of days <i>Earlier</i> than	<input type="checkbox"/>	}	1 - BETZES	2 - CALIFORNIA MARIOUT	3 - CONQUEST	4 - DICKSON
<input type="checkbox"/>	No. of days <i>Later</i> than	<input type="checkbox"/>		5 - PIROLINE	6 - PRIMUS	7 - UNITAN	

3, PLANT HEIGHT (From soil level to top of head):

3 1 - SEMIDWARF 2 - SHORT (California Mariout) 3 - MEDIUM TALL (Betzes) 4 - TALL (Conquest)

<input type="checkbox"/>	<input type="checkbox"/>	Cm. Shorter than.....	<input type="checkbox"/>	}	1 = BETZES	2 = CALIFORNIA MARIOUT	3 = CONQUEST	4 = DICKSON
<input type="checkbox"/>	<input type="checkbox"/>	Cm. Taller than.....	<input type="checkbox"/>		5 = PIROLINE	6 = PRIMUS	7 = UNITAN	

4. STEM:

2 Exertion (Flag to spike at maturity): 1 = 0 - 3 cm. 2 = 3 - 10 cm.
3 = 10 - 15 cm. 2 Anthocyanin: 1 = ABSENT 2 = PRESENT

0. 4 NO. OF NODES (Originating from node above ground) No other variety compared had this character

1 Primarily 1 - CLOSED 2 - V-SHAPED 3 - OPEN 2 Shape of Neck: 1 - STRAIGHT 2 - SNAKY
Collar Shape: 4 - MODIFIED CLOSED OR OPEN 3 - OTHER (Specify) . (See Fig. 4)

B. LEAF:

1	Basal leaf sheath (<i>seedling</i>):	1 = GLABROUS	2 = PUBESCENT	2	Position of flag leaf (<i>at boot stage</i>):	1 = DROOPING	2 = UPRIGHT
3	Waxiness:	1 = ABSENT (Glossy)	2 = SLIGHTLY WAXY	1	9	MM. WIDTH (First leaf below flag leaf)	W/L ratio-0.784
2	4	CM. LENGTH (First leaf below flag leaf)		2	Anthocyanin in leaf sheath:	1 = ABSENT	2 = PRESENT (some)

6. HEAD: Basal rachis internode short and straight

2	Type:	1 - TWO-ROWED	2 - SIX-ROWED	2	Density:	1 - LAX	2 - ERECT (Not dense)	internode (See Fig. 3)
4	Shape:	1 - TAPERING	2 - STRAP	3 - CLAVATE	2	Waxiness:	1 - ABSENT (Glossy)	2 - SLIGHTLY WAXY
		4 - OTHER (Specify)	<u>Slightly tapering</u>				3 - WAXY	
1	Lateral Kernels Overlap:	1 - NONE	2 - AT TIP	3	Distinctly shorter than Steptoe			
		3 - 1/4 - 1/2 OF HEAD			Rachis (Hair on edge):	1 - LACKING	2 - FEW	3 - COVERED

7. GLUME:

2 Length: 1 - 1/3 OF LEMMA 2 - 1/2 OF LEMMA
3 - MORE THAN 1/2 OF LEMMA

3 Hairs: 1 - NONE 2 - SHORT 3 - LONG

4 Hair covering: 1 - NONE 2 - RESTRICTED TO MIDDLE 3 - CONFINED TO BAND 4 - COMPLETELY COVERED
(sparse at edges)

2 Awns: 1 - LESS THAN EQUAL TO LENGTH OF GLUMES 2 - EQUAL TO LENGTH OF GLUMES
3 - MORE THAN EQUAL TO LENGTH OF GLUMES

4 Awn Surface: 1 - SMOOTH 2 - SEMISMOOTH 3 - ROUGH 4 = Semirough

8. LEMMA: Widely flaring awns. (See Fig. 1)

5 Awn: 1 = AWNLESS 2 = AWNLETS ON CENTRAL ROWS AWNLESS ON LATERAL ROWS 3 = SHORT ON CENTRAL ROWS, AWNLETS ON LATERAL ROWS 4 = SHORT (less than equal to length of spike) 5 = LONG (longer than spike) 6 = HOODED

5 Awn Surface: 1 = AWNLESS 2 = SMOOTH 3 = SEMISMOOTH 4 = ROUGH 5 = Semirough

2 Teeth: 1 = ABSENT 2 = FEW 3 = NUMEROUS 1 Hair: 1 = ABSENT 2 = PRESENT

2 Primarily Shape of base: 1 = DEPRESSION 2 = SLIGHT CREASE 3 = TRANSVERSE CREASE 2 Rachilla Hairs: 1 = SHORT 2 = LONG

9. STIGMA:

2 Hairs: 1 = FEW 2 = MANY

10. SEED:

2 Type: 1 = NAKED 2 = COVERED 1 Hairs on Ventral Furrow: 1 = ABSENT 2 = PRESENT

4 Length: 1 = SHORT (8.0 mm.) 2 = SHORT TO MIDLONG (7.5 - 9.0 mm.) 3 = MIDLONG (8.5 - 9.5 mm.) 4 = MIDLONG TO LONG (9.0 - 10.5 mm.) 5 = LONG (10.0 mm.)

2 Wrinkling of hull: 1 = NAKED 2 = SLIGHTLY WRINKLED 3 = SEMIWRINKLED 4 = WRINKLED

1 Aleurone Color: 1 = COLORLESS (White or Yellow) 2 = BLUE

0 2 PERCENT ABORTIVE 4 1 GMS. PER 1000 SEEDS

11. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant), 3 = Moderately Resistant, 4 = Moderately Susceptible

0 SEPTORIA 0 NET BLOTCH 0 SPOT BLOTCH 4 POWDERY MILDEW
2 LOOSE SMUT 0 BACTERIAL BLIGHT 2 COVERED SMUT 0 FALSE LOOSE SMUT
0 STEM RUST 0 LEAF RUST 0 SCAB 0 SCALD
0 AY 2 BSMV 0 BYDV 1 OTHER (Specify) Barley Stripe Rust

12. INSECT: (0 = Not tested, 1 = Susceptible, 2 = Resistant)

0 GREEN BUG 0 ENGLISH GRAIN APHID 0 CHINCH BUG 0 ARMYWORM
1 GRASS HOPPERS 1 CERIAL LEAF BETTLE 1 OTHER (Specify) Russian wheat aphid
HESSIAN FLY RACES { 0 GP 0 A 0 B 0 C
0 D 0 E 0 F 0 G

13. CHEMICAL (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

0 DDT 0 OTHER (Specify)

14. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Bracken	Seed size	Millennium
Leaf size	Statehood	Coleoptile elongation	Statehood
Leaf color	Century	Seedling pigmentation	Century
Leaf carriage	Century		

REFERENCES: The following publications may be used as a reference aid for the standardization of character descriptions and terms used in this form:

- Wiebe, G. A., and D. A. Reid, 1961, Classification of Barley Varieties Grown in the United States and Canada in 1958, Technical Bulletin No. 1224, U.S. Dept. of Agriculture.
- Reid, D. A., and G. A. Wiebe, 1968, Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests, Agriculture Handbook No. 338, U.S. Dept. of Agriculture. pp. 61 - 84.
- Malting Barley Improvement Association, Milwaukee, Wisconsin, 1971, Barley Variety Dictionary.

COLOR: Nickerson's or any recognized color fan may be used to determine color of the described variety.

FORM LFGS-470-5 (8-80) (REVERSE)

Exhibit D - Additional Description of Brigham

Brigham resembles Millennium and Statehood in some respects. Differences between Brigham and the other two varieties include, but are not limited to, the following characteristics:

1. Neck shape of Brigham is classified as snaky (Figure 4). Figure 4 does not give an accurate portrayal of the snaky neck shape of Brigham. The photograph shows only one dimensional bending of the stem, while in actuality, bending occurs in two or more directions. No other variety with which Brigham was compared has this characteristic.
2. Head shape of Brigham is slightly tapering, while Millennium and Statehood both have a tapering head (Figures 1 & 2).
3. Head density of Brigham [Erect (Not dense), (2.6 - 2.8 mm/internode)] is less dense than that of Statehood [Erect (Dense), (1.8 - 2.0 mm/internode)], (Figures 2 & 3).
4. Brigham and Statehood have no overlap of the lateral kernels, while Millennium has some overlap at the tip of the head (Figure 2).
5. Glume length for Brigham is $\frac{1}{2}$ that of the lemma, while that of both Millennium and Statehood is more than $\frac{1}{2}$ of the lemma.
6. Glume hair length for Brigham and Millennium is long, while that for Statehood is short.
7. Glume hair covering for Brigham is essentially complete (similar to Millennium), while that for Statehood is restricted to the middle of the glume.
8. Glume awns for Brigham are equal to the length of the glume, while those for Statehood are more than equal to the length of the glume, and those for Millennium are extremely long [Visible in Figure 2 (where they are not broken off)]. They are distinctly longer than on any other variety with which Millennium was compared.
9. Glume awn surface of Brigham is semirough, compared to rough for Millennium, and semismooth for Statehood.
10. Brigham has widely flaring lemma awns, while those for Millennium are erect, and those for Statehood are slightly flaring (Figure 1). The lemma awns on Brigham flare distinctly wider than on any other variety with which it was compared.
11. The lemma awn surface of Brigham is semirough, while that of both Millennium and Statehood is rough.
12. The lemma base of Brigham has a slight crease, while Millennium has a depression, and Statehood has a transverse crease.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE**EXHIBIT E**
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Utah State University	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER UT90B772-2120	3. VARIETY NAME Brigham
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) Logan, UT 84322	5. TELEPHONE (include area code) (435) 797-2243	6. FAX (include area code) (435) 797-3376
7. PVPO NUMBER 200000168		
8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		

9. Is the applicant (individual or company) a U.S. national or U.S. based company? If no, give name of country <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
10. Is the applicant the original owner? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO If no, please answer <u>one</u> of the following:	
a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)? <input type="checkbox"/> YES <input type="checkbox"/> NO If no, give name of country	
b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company? <input type="checkbox"/> YES <input type="checkbox"/> NO If no, give name of country	

11. Additional explanation on ownership (if needed, use reverse for extra space):

Brigham (UT90B772-2120) was originated and developed by Dr. Rulon S. Albrechtsen, plant breeder at the Utah Agricultural Experiment Station at Utah State University, Logan, Utah. By agreement between employee and the Utah Agricultural Experiment Station and Utah State University, all rights to any invention, discovery or development made by an employee are assigned to the employer. No rights to such invention, discovery, or development are retained by the employee.

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

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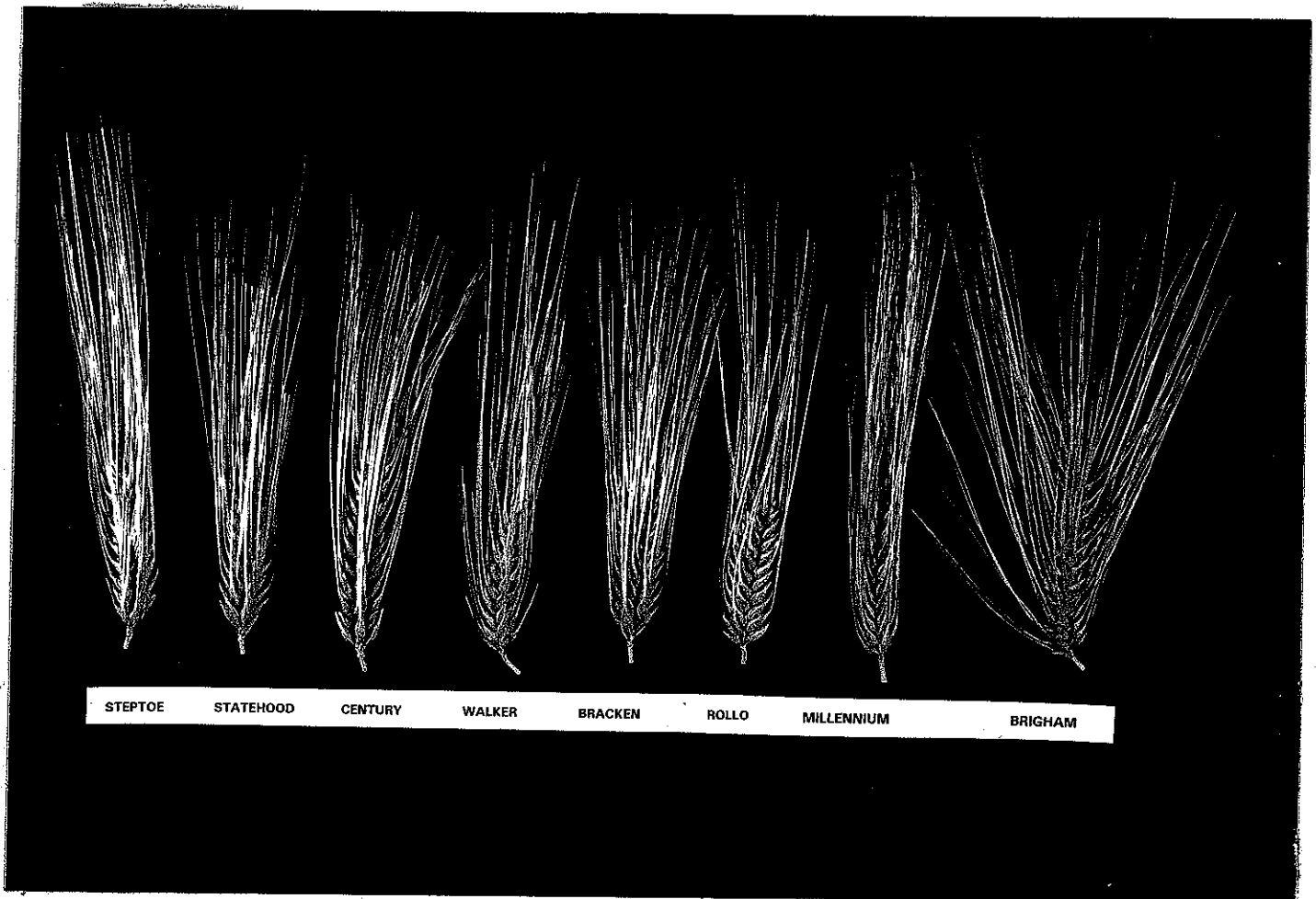


Fig. 1. General head and lemma awn characteristics of Brigham and comparative barley varieties. Note widely flaring lemma awns for Brigham.

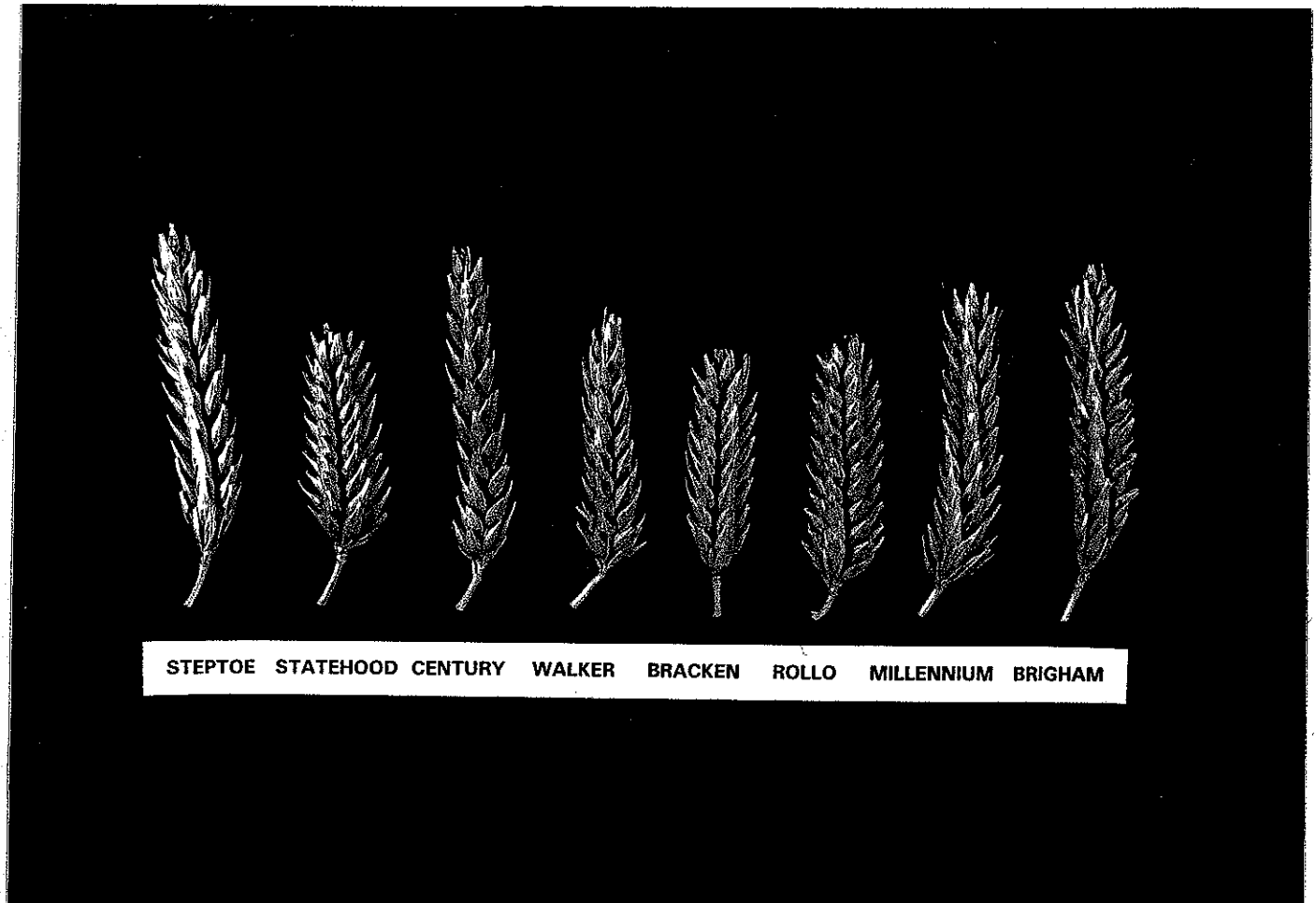


Fig. 2. Comparisons of head density, head shape and lateral kernel overlap for Brigham and comparative barley varieties. Also note visible very long glume awns on Millennium.

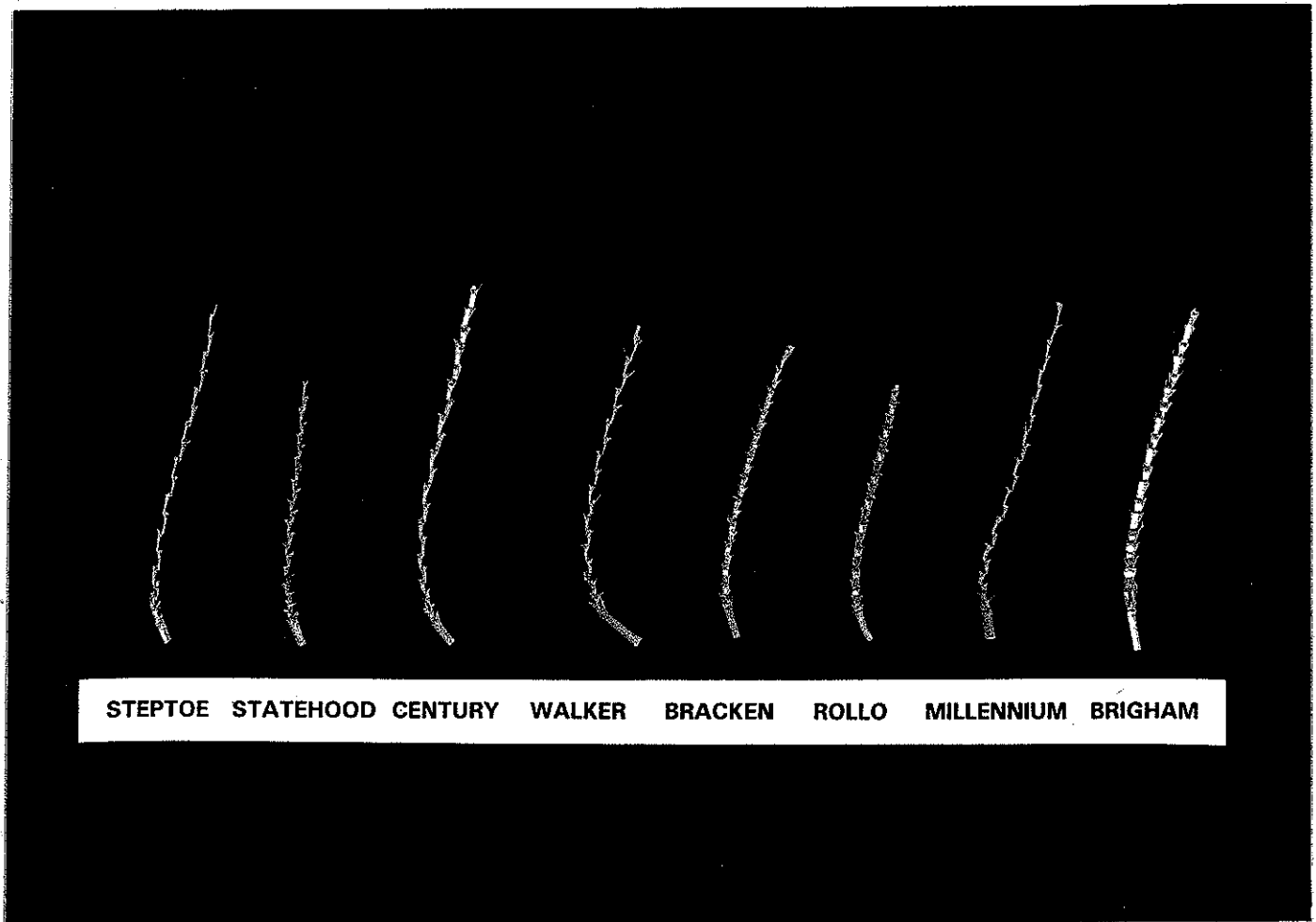


Fig. 3. Comparisons of head density for Brigham and comparative barley varieties.

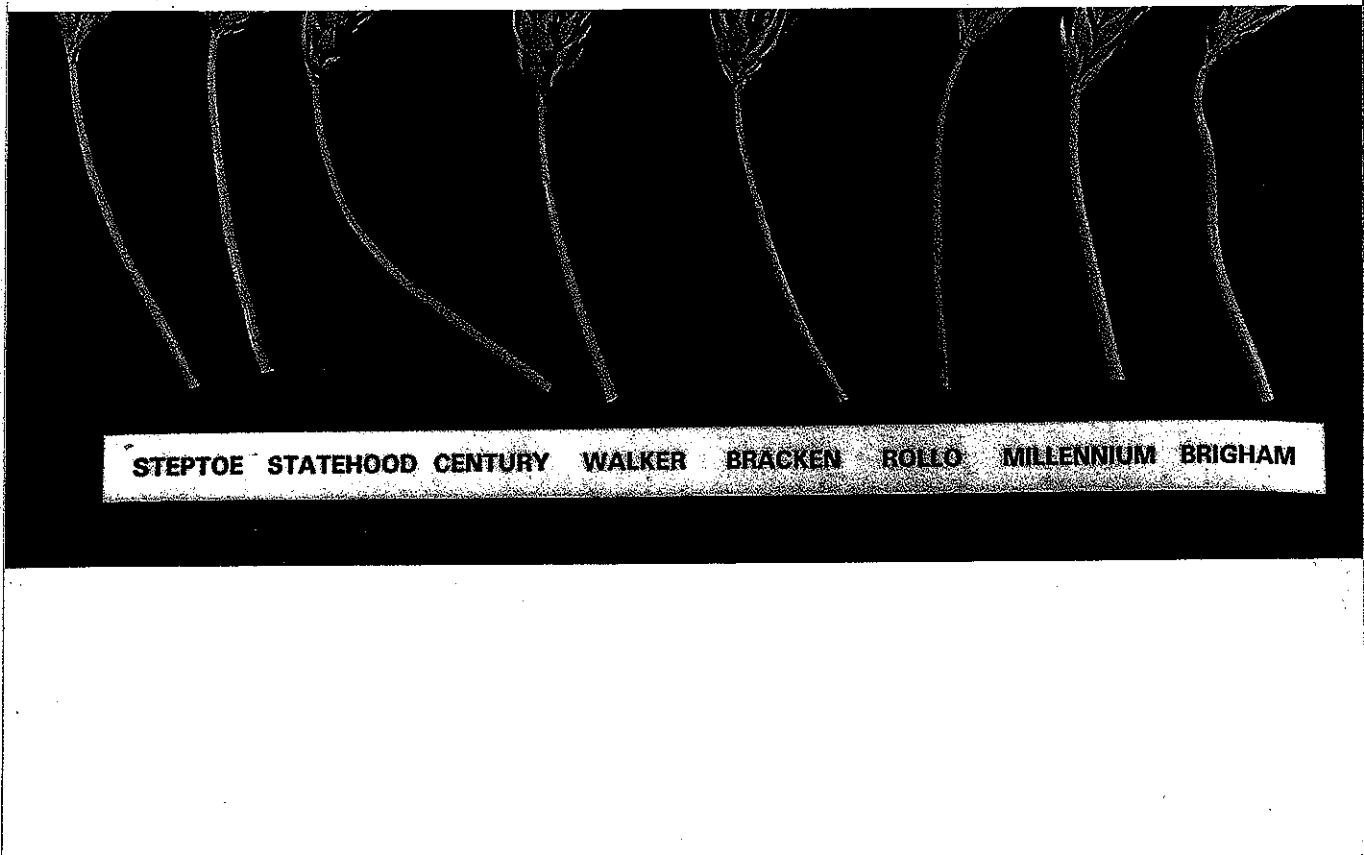


Fig. 4. Comparisons of neck shape for Brigham and comparative barley varieties. Note snaky neck shape for Brigham.